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A NEW HOLOTHURIAN OF THE GENUS THYONE
COLLECTED ON THE PRESIDENTIAL
CRUISE OF 1938

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Among the echinoderms collected by Dr. Waldo L. Schmitt during the Presidential cruise on the U.S.S. *Houston* in the summer of 1938 there are only two sea-cucumbers, both belonging to the same species. These two individuals were collected in Magdalena Bay on the west coast of Lower California. They represent a new species, which, however, is closely related to a form known from tide pools in California but, so far as our present knowledge goes, not known from south of Morro Beach.

Magdalena Bay seems to be the northern limit for the tropical "Panamic" region on the western coast of Lower California, and it is therefore likely that the new species will be found in other localities within the "Panamic" region. On the eastern side of Lower California the "Panamic" region reaches northward to the mouth of the Rio Colorado.

THYONE LUGUBRIS, n. sp.

Diagnosis.—A small form, a few centimeters long, with stout feet which are slightly larger and more numerous on the ventral side, where the original arrangement in 3 bands often is visible; on the dorsal side some of the feet are more papilliform. Tentacles 10, the 2 ventral smaller than the others. Calcareous ring with distinct, though fairly short, posterior prolongations on the radials; both the radials and interradials have a long anterior tooth. Stone canal small, delicate, embedded in the dorsal mesentery; head small, flattened with thickened edges, free to the right. Polian vesicle single, ventrally placed.

Spicules consisting of an external layer of knobbed buttons or plates with the external side covered by a reticulum. The inner layer consists of regular 4-holed knobbed buttons; the central knobs are often united into a distinct handle; some buttons are more lozenge-shaped, with an accessory hole in each end. In very small individuals

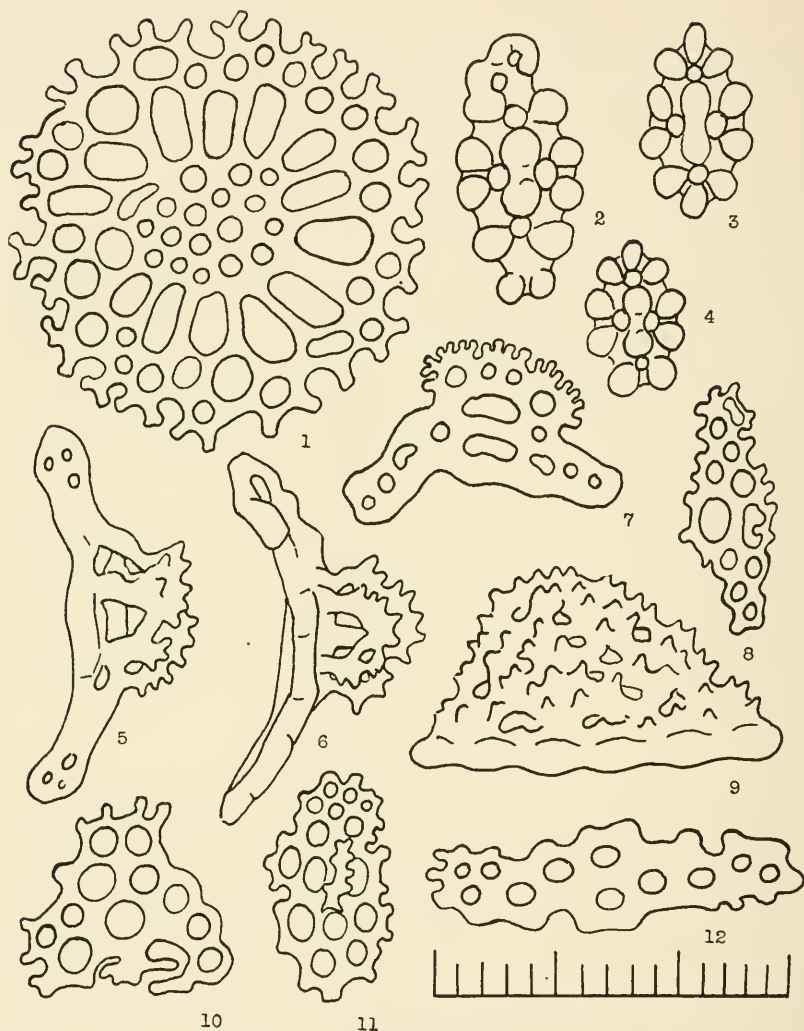


FIG. 1.—*Thyone lugubris*, n. sp.

1, end plate from young individual 3 mm. long; 2-4, knobbed buttons from inner layer of integument; 5-7, supporting tables from tube feet; 8, 10, 12, plates from tentacles; 9, plate from superficial layer of integument with external side covered by a reticulum; 11, table from introvert.

All from type, except No. 1 which is from an embryo from the type.

Scale, $\frac{1}{100}$ mm.

(3 mm. long) this inner layer is not yet developed. Feet with large end plate, which is reduced in the papilliform feet on the dorsum; the walls are filled with numerous supporting tables with a reticulated spire composed of numerous rods and ending in numerous branches or teeth. The introvert contains tables with a low spire and numerous holes in the disk. The tentacles are packed with heavy perforated rods and plates; toward the terminal branches the deposits become smaller and more delicate, with larger holes.

The color is mottled brownish, with black tentacles.

The species is viviparous.

Locality.—Magdalena Bay, west coast of Lower California; inside the northern point of the entrance to the bay, between Belcher Point and the anchorage; 10-15 fathoms (18-27 m.); sandy and weedy bottom; July 18, 1938. Two specimens. (Type, U.S.N.M. no. E.5624; cotype, U.S.N.M. no. E.5625.)

Remarks.—The type is a female 15 mm. in length, with 13 embryos, and the cotype is probably a male, 10 mm. long; both are well expanded.

The gonads are well developed in both specimens and consist of 2 tufts each with about 10 tubules. In the larger type the tubules are short and some are almost empty—one contains one large egg while the others are more opaque. The oviduct appears to open into the body cavity, near the stone canal. Thirteen embryos of varying age were found lying free in the body cavity. The smallest embryo measures 1 mm. in length and lacks all appendages except 5 cylindrical tentacles. The largest embryo measures 3 mm. and has 5 double rows of tube feet and the full number of tentacles, which all are branching as in a typical dendrochirote. The spicules in the smallest embryo are of the usual juvenile type which occurs in almost all immature specimens—large plates regularly perforated by holes all of about the same size. In the stages following, the typical spicules begin to appear, although rather incompletely developed. In the oldest stages the spicules are as in the mother animal, except that the layer of inner buttons has not yet appeared. The color of the embryos ranges from completely unpigmented white to mottled gray with numerous pigment dots.

The cotype has gonads with much longer tubules, with scattered pigment spots. The tubules are opaque and appear to contain only small cells, so it is probably a male. The opening of the gonadial duct could not be traced with certainty; probably it opens on the dorsal side between the tentacles or closely behind them as in most *Dendrochirota*.

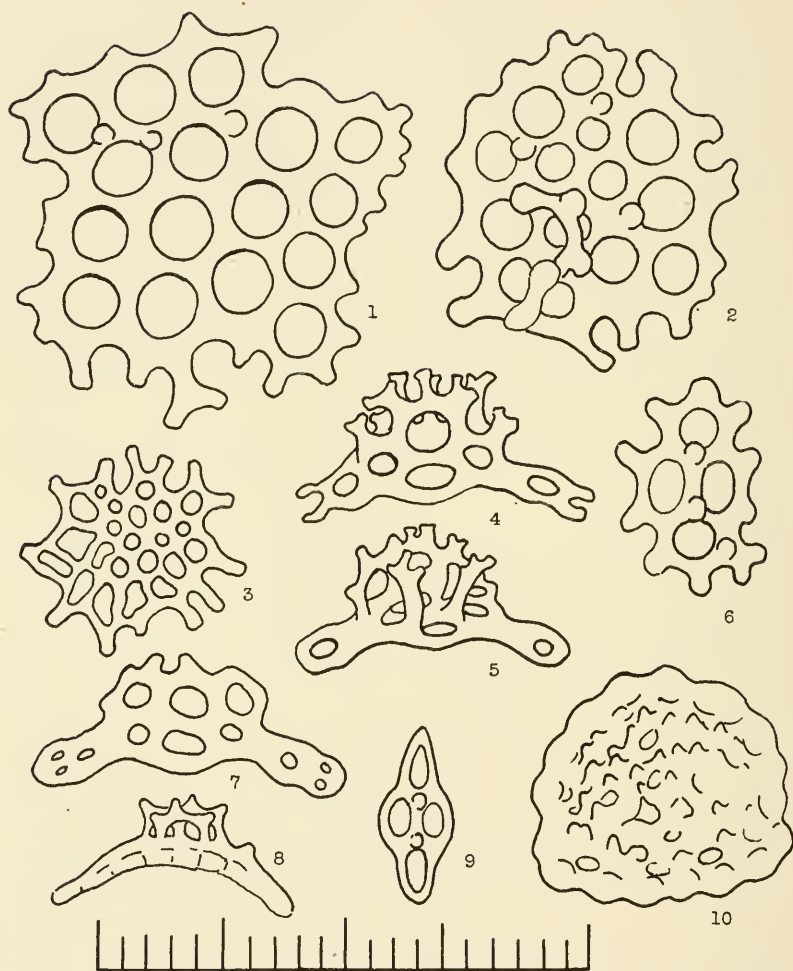


FIG. 2.—*Thyone lugubris*, n. sp.

1-2, primitive plates from integument of small embryo; 3, end plate from a small embryo, with few tube feet; 4-5, 7-8, supporting tables from tube feet; 6, beginning stage of knobbed reticulated plate from external layer of integument; 9, beginning stage of a knobbed button; 10, knobbed reticulated plate from external layer of integument.

All from a small embryo, 1.5 mm. long.

Scale, $\frac{1}{100}$ mm.

From the Californian form *Thyone rubra* H. L. Clark, *Thyone lugubris* differs in its mottled grayish brown color and black tentacles, contrasting strikingly with the vivid orange dorsum and tentacles and snow-white ventrum of the northern form. The former reaches normally a length of 30-40 mm., but very likely this is also true of *lugubris*, as apparently most dendrochirotes continue their growth after reproduction has set in. The spicules are slightly smaller in the southern than in the northern form.

Both species are viviparous, and the observations made by Dr. H. L. Clark regarding the number of embryos developed, etc., in *Thyone rubra* agree in all essentials with what has been found in *Thyone lugubris*.

The life history of the dendrochirote holothurians in which the female develops the embryos free in the body cavity is rather imperfectly known. Hörstadius (1926) has studied the very similar conditions in the Mediterranean form *Phyllophorus urna* Grube, and was the first to discover that the oviduct opened directly into the body cavity, as one logically would expect, and apparently the eggs are set free here at intervals. How they are fertilized—if, indeed, they are fertilized at all—is unknown. When the embryos have reached a length of several millimeters, they are apparently set free one or two at a time, probably by breaking through the respiratory trees or through the intestine.

Both *Thyone rubra* and *Th. lugubris* belong definitely to the same group, and when the genus *Thyone* finally is revised they will be placed in a separate genus by themselves. They differ from the two other species of *Thyone* with knobbed buttons which are known from the tropical part of the Pacific coast of America in the presence of the large buttons or plates with the external side covered by a huge reticulum. The other species have either buttons with a strongly spinous handle (*Thyone gibber* [Selenka]), or an external layer of delicate reticulated baskets (*Thyone panamensis* Ludwig).

From the West Indies no species so far has been reported which has spicules similar to those which characterize *lugubris* and *rubra*, nor does it appear, from a perusal of the literature, that they have any relatives in other parts of the Pacific Ocean.

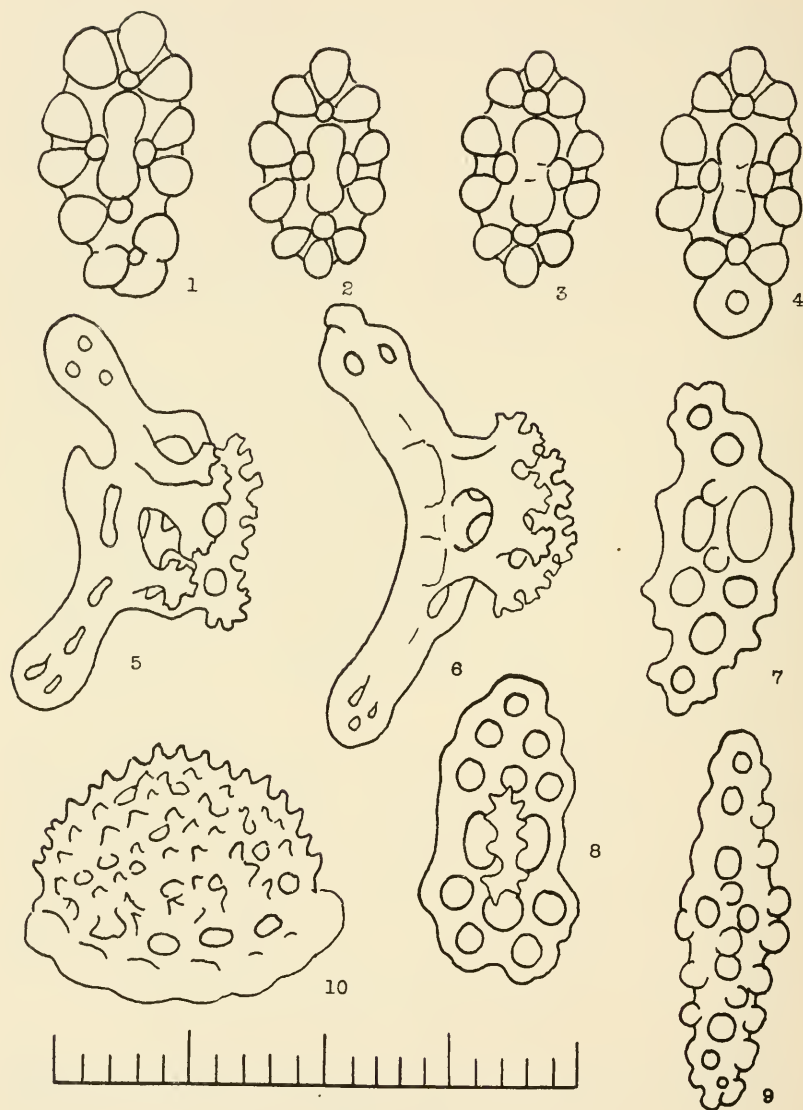


FIG. 3.—*Thyone rubra* H. L. Clark.

1-4, knobbed buttons from the inner layer of the integument; 5-6, supporting tables tube feet; 7-8, tables from introvert; 9, plate from tentacle; 10, knobbed plate from external layer of integument, medium size.

Scale, $\frac{1}{100}$ mm.

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